THURSDAY, OCTOBER 30, 1879

STERRY HUNT'S CHEMICAL AND GEOLOGICAL ESSAYS

Chemical and Geological Essays. By Thomas Sterry Hunt, LL.D., F.R.S., &c. Second Edition, revised, with Additions, pp. 489. (London: Trübner and Co., 1879.)

THIS book contains twenty essays, and a preface, itself an essay, some of which were written as early as 1853, and the others have appeared from time to time, either as original contributions, reviews, or lectures. These literary and scientific efforts are but a small part of Dr. Sterry Hunt's contributions to chemical and dynamical geology, but it would appear, from the preface to the first edition, that a selection was made upon a definite idea. The selected essays, as a whole, cover, he considers, nearly all the more important points in chemical geology; and the introduction of one relating to the hypothesis of a cooling globe and of "certain views" of geological dynamics, he considers make together a complete scheme of chemical and physical geology. He was disposed to re-write some of the essays, but this was not done, because they seem to the author to have a certain historic value and serve to fix the dates of the origin and development of views, some of which, after meeting for a time with neglect, or with active opposition, are now beginning to find favour in the eyes of the scientific world. Dr. Sterry Hunt states that his views, for which his fellow-workers were not prepared, were subsequently propounded by them as new discoveries or original conclusions. Five of the papers, moreover, contain, according to the author—writing in 1874—the germs of a philosophy of chemistry and mineralogy which he hopes one day to develop himself or to see developed by others.

There is no doubt that, although Dr. Sterry Hunt may be satisfied that his views are correct on all the very numerous subjects he has entertained, there is not a single chapter, one might say a single page in many, which will not meet with very decided opposition on the part of scientific men who are not likely, in after years, to let their hypothetical conversion precede their assumption of originality.

It is difficult in reading this book, full of good facts, but crammed with hypotheses and arguments about priority of thought, to believe that the author is a most genial man, and who is imbued with the true spirit of science. Very much of the type of the late David Forbes, he really is the last man whom one would believe would be so dreadfully polemical. Yet he must know that the book can only be appreciated by advanced geologists and chemists who really do care that the discoverer of a *fact* or of a *method* should have a proper priority, but who do not care about who first put forward certain *views* on subjects incapable of proof or indulged in scientific *guesses* before the fact. There is no doubt that with regard to a science like that of geology, men working in different countries at the same subject, arrive simultaneously at the truth or what seems to be true in relation to facts which are common property. A register of opinion, whether expressed at lectures, debates, addresses, or published in journals, is clearly impossible. Moreover, there is a great amount of unwritten geology which is common knowledge, but no one thinks it worth while to write it and claim a priority. Hence any one taking up a variety of subjects must suffer from not having his ideas recognised at once and may really be unfairly placed in the background. But as there is usually no intention of an evil character, it is unwise to be so very touchy upon priority in hypothesis. Very characteristic of certain zealous minds, is this everlasting harping on who made the discovery of a fleeting hypothesis first.

On looking over these essays we are struck that whilst a controversy with Dana is recorded, the celebrated reply of David Forbes to some of the author's views is not given. And some of the contributions seem to represent former views of the author, and not those which he has since developed. Mallet will feel uncomfortable when he reads how he has been forestalled in his kinetic theory, but it is satisfactory to have the cap put on the right head. Dr. Sterry Hunt has settled volcanicity, and may be thus quoted: "With the contributions of Vose and Mallet, the theory of volcanic action advocated by Keferstein, Herschel, and myself, would seem to be well-nigh complete." This self-commendation will, however, not establish the nonsense of Keferstein, whom the author terms irrational, or the mere passing expression, without confirmatory facts, of Vose, and it will not enable him to stand on the same footing as the philosophic and modest Mallet.

Should any geologist make an original suggestion, do not advise him to refrain from publication; or if it is to be given to the world, let it be done at once. Otherwise Dr. Sterry Hunt may suffer, as he did in the odd matter of limestones, dolomites, and gypsums, and the illustrious but reticent Cordier. On October 28, 1844, a memoir was deposited with the Academy by this geologist. Being in a sealed packet, writes Dr. Sterry Hunt, its contents remained unknown until after his death, when at the request of his widow the seal was broken. No money was found and not a codicil, but on February 17, 1862, a remarkable theory transcending everything geological and fully explanatory of the formations of those limestones, came to light. It fell flat, for Dr. Sterry Hunt had maintained similar views, or rather more correct views, for four years.

Prof. Ramsay is so hardened a debater that he will not be utterly cast down, it is to be hoped, by having one of his hypotheses snatched from him and placed on the prior brow of our author. It was not for some years that certain *views* of the author on the formation of dolomites "found recognition." "When Prof. A. C. Ramsay, by the investigation of the magnesian limestone of the Permian in England, was led to reject as untenable the notion held by Sorby (and by others) that this was once an ordinary limestone of organic origin subsequently impregnated with magnesian carbonate under conditions not explained; and to conclude that the carbonates of lime and magnesia of which it is composed had been deposited simultaneously by the concentration of solutions due to evaporation in an inland salt lake." To this view as he informs us, he (Ramsay) was led by physical considerations and "by the depauperated condition of the

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organic remains contained in these strata, *without being at the time aware that I had twelve years previously announced the same conclusions for all magnesian limestones, and established them on chemical grounds.*" The italics are ours, for Prof. Ramsay's especial benefit. The author concludes his last essay on the theory of types in chemistry, with some good advice to a thoughtless-Sterry-Hunt-neglecting posterity :—"In conclusion I have only to ask that future historians will do justice to the memory of Auguste Laurant, and will, moreover, ascribe to whom is due the credit of having given to the science, a theory which has exercised such an important influence in modern chemical speculation and research; remembering that my own publications on the subject, which cover the whole ground, were some years earlier than those of Williamson, Gerhardt, Würtz, or Holbe." It is a pity that much good scientific work should be encumbered by these vanities, and really much that is objectionable can be compensated by the study of such essays as those on the chemistry of natural waters, which is admirable and suggestive.

THE PHILOSOPHY OF MUSIC

The Philosophy of Music. Royal Institution Lectures. By W. Pole, F.R.S., F.R.S.E., Mus. Doc. Oxon. (London: Trübner and Co., 1879.)

IT has long been felt by intelligent persons anxious to possess some acquaintance with the scientific side of music, that the technical works to which they have recourse for the desired knowledge are unsatisfactory from a logical point of view. We are acquainted with no work on technical music which offers any reasonably intelligent explanation of the basis on which its material is founded; and a school has arisen, no doubt partly as a reaction from the crude speculations and unsupported dogmatism of many standard works, which refuses to acknowledge anything beyond the mere acquirement of technical facility in composition as a desirable object in the study of the so-called science of music.

The work of Dr. Pole appears to be intended as a protest against this limitation. It is an endeavour to make plain so much of æsthetic and physical acoustics, and the *rationale* of technical music, as may enable the musician to give some sort of intelligent reason for the faith that is in him.

Dr. Pole's well-known musical attainments are a guarantee for the soundness of the work so far as musical technicalities are concerned. As to general questions of evolution, the nature and objects of musical grammar, the origin and nature of scales, and of the technical rules of music, we think that this book leads the way among English works, in a logical, or perhaps we had rather say, in a common sense treatment of the subject.

It is useless within the limits of this article to attempt to convey any idea of the arguments employed. For the most part the opinions of Helmholtz have been adopted. Whatever may be the ultimate opinion as to the absolute accuracy of these views, there can be no doubt that their admission changes the fundamental study of music from an unmeaning dogmatism into a science.

The first part of the work gives a sketch of the material of music, and forms a treatise on elementary acoustics. The second part deals with the evolution of melody, the history of the scale, melodic and harmonic relations, rhythm and form. The third part is entitled "The Structure of Music." Its most important items are the history of harmony, and the discussion of its rules, combinations, and progressions. It concludes with a slight notice of counterpoint. The characteristic of the book seems to be that a good idea may be obtained from it of a sound body of musical doctrine, comprising foundation, history, and technique.

We select two or three points for notice, as to all of which we are not perhaps quite in accord with Dr. Pole.

There is something yet to be said as to the difference in the way in which the highly gifted musician and the ordinary listener hear music. The observations on the decay of counterpoint (p. 288) seem to want some notice of this. It is more or less a waste of energy to write music in many parts, all of which are made melodious at some sacrifice of the harmonic effect, when not more than perhaps one in a hundred listeners is capable of hearing more than one melody at a time. We think that it is not the power of writing counterpoint that has died out so much as the will to write it. There can be no doubt that the unpopularity of counterpoint is mainly due to the fact that the ordinary listener is unable to hear in it what the highly gifted musician hears. The many simultaneous melodies are quite lost on the ordinary listener. It is only in the case of the greatest composers, whose principal melodies and harmonies do not suffer by their attention to the counterpoint, that works of this class attain any popularity. Until the acquirement of the power of hearing many simultaneous melodies is placed within the reach of the ordinary listener by a suitable and widespread education specially directed to this purpose, it is useless to look for a popular interest in counterpoint, which shall encourage the composer to produce it. There is a question how far it is possible for a person not naturally gifted with the polyphonic ear to acquire it in perfection. But there can be no doubt that systems of education are possible which will do much towards advance in this direction; and that the direct cultivation of polyphonic hearing and reading is the shortest cut towards the formation of the true musician.

There is an incompleteness in Dr. Pole's statement of Helmholtz's explanation of consonance and dissonance, which is important, as it affects the logical foundation of this part of the work, which however forms but a subsidiary portion of Dr. Pole's book. The point in question has been discussed at large some time ago by Prof. Mayer, Mr. Sedley Taylor, and others. It will be sufficiently explained by quoting the summary of the principles which Dr. Pole employs in the discussion of the examples of chords, and also a passage from Helmholtz which contains the considerations omitted.

(Dr. Pole's book, p. 210.) "Now having given these two data, velocity of beating, and strength of beating notes, we may examine some of the binary harmonic combinations of sounds, and see in what manner and to what extent the partial tones, of which the sounds are made up, give rise to the beating or harshness above described."

The following passage will show that another set of data is required, namely, the law according to which the

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